Amendments to the Drawings:

In the DRAWINGS Section, please replace drawings Fig. 5, Fig. 6, Fig. 10b and Fig. 10c, presented in the attached Replacement Sheet.

In all drawings some additional dotted frames show the limits of certain circuits or additional frames show which circuits are contained in a higher level circuit.

In Fig. 6 the Reference Circuit **RefCirc** with its reference output signals and the signal-lines **Vtune** are rearranged for improved understanding.

Fig. 10a, Fig. 10b and Fig. 10c are improved to show the identical circuit for a switching device **SW**. Also in Fig. 10b and Fig. 10c the presentation of the Temperature Compensating circuit is improved.

Attachment: Replacement Sheets for Fig. 5, Fig. 6, Fig. 10b and Fig. 10c

REMARKS/ARGUMENTS

In response to the subject Office Action, an Amendment to the Specifications, to the Claims and to the Drawings section is herein submitted.

Examiner Nguyen is thanked for thoroughly reviewing the above referenced patent application, and for the indication of allowability once various formal matters and informalities are corrected.

Remarks and Arguments on Drawings Objections
as stated in the Office Action, dated Oct. 30, 2007

Reconsideration of the objection of drawing 10b as being not correct is requested, based on the following:

Generally, in logic circuit drawings, inputs are shown on the left side of a circuit block and outputs are shown on the right side. Therefore, based on this rule, drawing 10b may seem to be incorrect. However general presentation of translinear amplifiers deviates from that rule, because of the their specific nature: one of the outputs also serves as an input for the output reference level. See Fig. 5 and Fig. 6 and also see the detailed descriptions in the companion US Patent Application Serial No. 10/764920 (now US Patent 6,937,098), which was included by reference to the present application.

- The output signal's difference always follows the difference at the translinear amplifier's inputs according to the formula **Voutp-5 - Voutn-5 = Vinp-5 - Vinn-5** with a gain of 1, i.e. the relative output signal is well defined but the absolute output voltage is undefined; both outputs are floating to any level, if not forced to a specific voltage by some external signal.

- When a reference voltage is applied to one of the outputs, also the other output takes defined absolute voltage level (according the above formula).

In fact one of the outputs takes a double role: it is output for the relative signal and it is input for a reference signal. Though output **Voutn-5** is drawn on the right side, it is at the same time input for the "output reference" **Ref-out-5**. In that sense, applicant is convinced, the drawing is correct.

Due to the symmetrical nature of translinear amplifiers, the outputs may change their role: signal **Voutp-5** may also be forced to any desired reference level – then the voltage at **Voutn-5** will always follow that forced reference level with a difference of **Voutp-5 - Voutn-5 = Vinp-5 - Vinn-5**,

To explain the specific translinear amplifier's characteristic, a paragraph was added as follows (and two other paragraphs were accordingly amended):

The translinear amplifier in **Fig. 5**, imbedded within said circuit to control the switching operation **Switch-Ctrl** compares the differential voltage at its inputs **Vinp-5** and **Vinn-5** and, through various current mirroring techniques, provides the same differential voltage at its outputs **Voutp-5** and **Voutn-5**; i.e. the output difference of said amplifier strictly follows the input difference, independent of the absolute voltage level at the outputs. In fact, the outputs are floating together, however the signal **Voutn-5** may also be forced to any desired reference level –

then the voltage at **Voutp-5** will always follow that forced reference level with a difference of **Voutp-5 - Voutn-5 = Vinp-5 - Vinn-5**. It should be noted at this point, that signal **Voutn-5** effectively operates as an input signal, though it is drawn on the right side of the amplifier symbol, which normally represents output signals - **Voutn-5** operating as an input allows to apply a desired output reference level.

Remarks and Arguments on Claim Objections

Claims 6 and 10 are amended according to the examiner's suggestion.

For corrections to remove the objection on claim 9 see the arguments later in this document.

Remarks and Arguments on Claim Rejections due to 35 USC §112
as stated in the Office Action, dated Oct. 30, 2007

Reconsideration of the rejection of claims 1-4, 6-23, 26-28,30-49, 51 and 52 as being indefinite is requested, based on the following.

Some General Remarks on references and nomenclature used in the claims

- The circuit description in specifications and the circuits presented in the claims relate primarily to Fig. 5, Fig. 6, Fig. 10a, Fig. 10b and Fig. 10c
  Fig. 5 shows a single Capacitor Switching Stage, comprising "a switching device" and "a circuit to control the switching operation of said switching device".
  Fig. 6 shows a multiple (1 to n) of said Capacitor Switching Stages of Fig. 5.
  Fig. 10a shows the same Capacitor Switching Stage as in Fig. 5 with two additional circuits, one "to drive said switching device to a fully on status" and the other "to drive said switching device to a fully off status".
  Fig. 10b shows again the same Capacitor Switching Stage as in Fig. 5 with an

additional circuit "to compensate the temperature deviation of said switching device". In Fig. 10b, said circuit to compensate the temperature deviation of said switching device receives an "output reference" signal **Ref-out** and produces a "compensated output reference" signal **Ref-out-c**, which is then connected to the output reference point **Voutn** of the translinear amplifier. Please refer to a newly added paragraph on page 16, which describes the specific characteristic of translinear amplifiers: "similar to Differential Amplifiers, a Translinear Amplifier has differential inputs and has differential outputs"; therefore the reference output point **Ref-out-10** serves as input for said reference voltage.
Fig. 10c is the same as Fig. 10b – but instead of receiving a specific output reference, the compensating is connected to ground, which may be an appropriate reference for a switching device that has its transistor-base also connected to ground.

- **Fig. 9** is simply to show a real implementation of a circuit according to Fig. 6, implementing the reference circuit **RefCirc** with a simple resistor chain to provide the input reference levels and with a single signal line to provide a common output reference.
  Fig. 9 is not the base for the circuits as referenced in the claims.

- The phrases "a circuit to control the switching operation", "a circuit to drive said switching device to a fully on status", "a circuit to drive said switching device to a fully off status" and "a circuit to compensate the temperature deviation of said switching device" are used as generic names in the claims. When referencing and/or reciting a specific circuit, always the whole phrase is used. (There is not just a recitation as "said circuit".) In the present Office Action, a short form of the circuit function is added, like "a first cut-off circuit to drive said switching device to a fully on status", "a second cut-off circuit to drive said switching device to a fully off status" and "a temperature compensating circuit to compensate the temperature deviation of said switching device".

Detailed Remarks:

Several of examiner's reasons for rejection are removed in a combined amendment of claim 1:

1. A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time; comprising:
a set of individual small capacitors;
a set of capacitor switching stages, each stage comprising;
a switching device, allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors, to connect a multiple of said capacitors in parallel;

a circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner between the points of being fully switched on and fully switched off, comprising:

a translinear amplifier to produce a ramp-up/ramp-down signal for said switching device, where said translinear amplifier is implemented within said circuit to control the switching operation;

a common circuit to ~~individually~~ provide a set of input and output reference levels for each of said capacitor switching stages, ~~building the~~ used as input reference levels and ~~the~~ output reference levels for each of said translinear amplifiers, comprised within said ~~capacitor switching stages~~ circuits to control the switching operation; and

~~an~~ input signals, each dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, provided to ~~the~~ an inputs of all of said capacitor switching stages.

In addition several changes are made to the drawings to easier identify the various elements of the total circuit; Fig. 5, Fig. 6, Fig. 10b and Fig. 10c is slightly modified. Specifically the drawings show that the "Capacitor Switching Stage" contains the "Switch Control" **Switch-Ctrl** and the "Device Switch" **SW** (see Fig. 5) and that there is a common circuit **RefCirc** to provide the input and output reference levels to all Capacitor Switching Stages (see Fig. 6). Please also refer to the previous description of the translinear amplifier's specific characteristics to eliminate some of the misinterpretations.

Similar to claim 1, claims 17, 26, 33, 43 and 47 are amended to remove the same or similar reasons of objection and rejection. In claim 17, the additional terms "a first cut-off circuit" and "a second cut-off circuit" are now added to avoid certain possibilities of misinterpretation; the affected paragraphs now start with: „a first cut-off circuit to drive said switching device to a fully on status" and "a second cut-off circuit to drive said switching device to a fully off status". The same terms are also added to claim 43, as well as the claims dependent on claims 17 and 43. Similar, in claim 26, the additional term "a temperature compensating circuit" is now added to avoid certain possibilities of

misinterpretation; the affected paragraph now starts with: "a temperature compensating circuit to compensate the temperature deviation of said switching device"

Regarding claim 33 and 43 and its recitation "with increasing/decreasing share" as being "indefinite because it is not clear what it is meant by", please refer to the description on page 18 starting at the last paragraph "In the same way as described in said related patent application US Serial No. 10/764920, within a set of small capacitors Cap 1 to Cap n, one capacitor after the other is switched in parallel to change the total capacity. Each capacitor has its individual switching device Sw 1 to Sw n. To achieve a linear capacitance change, said capacitors are not switched on one by one in digital steps, however each capacitor is switched on partially in a sliding operation, starting at low value (0 % of its capacitance) and ending with the fully switched on capacitor (100 % of its capacitance), i.e. the capacitor is switched on with increasing (or decreasing) share."

Regarding claim 43, the recitation "the linear control signal on lines 29 lacking antecedent basis, is now amended to "a linear control signal".

Regarding claim 47, an erroneous linefeed, comma and some blanks were inserted before the third paragraph, which starts with the phrase:" and a circuit to individually provide input and output reference levels for each individual capacitor switching stage"; please remove. Further regarding claim 47, to amend the recitation "and a circuit to individually provide input and output reference levels for each of said capacitor switching stages, an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change ...." please see a new paragraph with additional information added in the specifications on page 16 and see some additions in the drawings. The recitation "the linear control signal" on line 21 lacking antecedent basis was already amended in the Office Action dated June, 30. 2007.

Remarks and Arguments on Examiner's *„Response to Arguments"*

Applicant does not agree with Examiner's view as Fig. 10b not being correct. Please read the above chapter "**Some General Remarks**" and the newly added paragraphs on page 16. The source of some possible misinterpretation should now be removed. Applicant is convinced, drawings 10a, 10b and 10c are correct.

Regarding the previous argument on claim 33 with the recitation "said signal" on line 18 and with the recitation "said input reference" on line 21, the present amendments should solve the remaining inconsistencies.

Thorough care is taken to not include by accident any new matter.

Reconsideration of the above rejection is therefore respectfully requested.

All claims are now believed to be in condition for allowance, and allowance is so requested.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

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